Workshop 9: Collaboration Between Programs for Prevention and Elimination of Perinatal Infectious Diseases Workshop

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The goals of the workshop were to share information on surveillance and prevention programs targeted at perinatal infectious diseases and to encourage collaborative efforts.

Perinatal Hepatitis B Prevention Program

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To understand the problem of perinatal hepatitis B (HBV) in the United States, consider the following:

- 24% of chronic hepatitis B infections in the U.S. are due to perinatally acquired infections
- CDC estimates approximately 19,000 births to HbsAg-positive women annually (state programs are currently identifying only 9,000 because of variation in state reporting requirements)
- perinatal transmission is very efficient: for only HbsAg-positive women, 20-40%; for HbsAg- and HbeAg-positive women, 70-90%
- 90% of infants who acquire infection perinatally become chronic carriers; 25% of them will die from liver failure due to HBV infection
- 55% of HBV-exposed births are to Asian women, 20% to African Americans, 10% to Whites, 6% to Hispanics, 9% other.

The key components of perinatal hepatitis B prevention programs include:

- screening for HbsAg, the critical first step in identifying potentially exposed infants (currently about 95% of pregnant women are screened for HbsAg)
- reporting of all HbsAg-positive women to health department
- post-exposure prophylaxis at birth
  - infants exposed at birth--administer HBIG and first dose of hepatitis B vaccine within 12 hours of birth
  - high risk of chronic HBV infection
  - potential continuing risk within household
- high degree of communication required between obstetricians, gynecologists, hospitals, laboratories, pediatricians and health department
- case management and tracking to ensure:
  - immunoprophylaxis at birth
  - completion of 3-dose vaccination series by 6 months of age
  - post-vaccination serologic testing
  - identification and vaccination of susceptible household contacts and their sexual contacts.

Hepatitis B infections are sometimes asymptomatic (the infection may not show up for years). Thus, disease surveillance will not always detect infections. Adverse outcomes (e.g., chronic liver disease) of hepatitis B infections do not occur for many years.

Effective strategies to identify, treat and follow-up infants born to HbsAg -positive mothers include:

- screening all pregnant women
- enhanced case management of infants to include:
  - contacting HbsAg-positive woman before delivery
  - informing pediatrician and delivery hospital of maternal HbsAg status
  - computerized tracking to ensure appropriate and timely post-exposure prophylaxis
- multiple reporting systems
- persistence and dedication.

A proportion of the target populations for perinatal HBV and HIV prevention programs share similar risk factors. There are also similarities in reporting mechanisms and transfer of information. Some potential links between these programs include:

- integration of assessment/monitoring activities
  - adapt hepatitis B screening audits to include screening for HIV and other perinatal diseases (implemented in Delaware, Massachusetts and Maine)
  - adapt newborn metabolic screening card to include maternal HIV and HbsAg results
- collaboratively work with birthing hospitals to establish treatment protocols; written and/or standard policies for screening, immunoprophylaxis and treatment
- structural integration of the programs in health departments--allows use of funding from different sources, i.e., "loosening up" categorical funding (implemented in Connecticut).

Syphilis Elimination Program: Congenital Syphilis

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Congenital syphilis results from infection of the fetus by *Treponema pallidum*. For 4 years after acquiring syphilis, the probability of transmitting infection to the fetus is greater than 70%. Forty percent of pregnancies in women with untreated early syphilis end in perinatal death. Infected infants that survive can develop acute systemic illness, bone deformities, blindness, or deafness. Congenital syphilis may be prevented by treating infected pregnant women with penicillin.

A study of syphilis among HIV-positive mothers and their infants in Houston and Dallas, Texas, 1988-1994 revealed that:

- 816 infants born to 718 HIV-positive women
- of the 718 women, 127 (18%) had been diagnosed with syphilis
- 97 infants (12%) were born to mothers with syphilis during pregnancy
- 49 infants (6%) were reported to have congenital syphilis
- among women with HIV infection, characteristics associated with syphilis included black race, being unmarried, and use of injection drugs.

A study of mortality associated with congenital syphilis in the United States, 1992-1998 showed that :

- from 1992-1998, 14,627 cases of congenital syphilis were reported in the United States

- 760 stillbirths were reported, and 182 deaths within 3 months of birth
- 71% of mothers of infants who died were documented to have untreated or inadequately treated syphilis before or during pregnancy
- 52% of deaths occurred before 30-weeks gestation
- to prevent deaths, treatment needs to occur by mid-second trimester.

An infant born to a woman with untreated or inadequately treated syphilis at delivery constitutes a presumptive case of congenital syphilis (case definition, 1988). Laboratory confirmation of *Treponema pallidum* infection in the neonate constitutes a confirmed case.

An analysis of 801 case reports of congenital syphilis in the United States in 1998 identified the following reasons for vertical transmission:

- 651 (81%) of the infants were born to women with untreated or inadequately treated syphilis before or during pregnancy; of these, 233 (36%) received no prenatal care
- 91 (11%) were born to women with equivocal serologic response to therapy; 30 of these had clinical evidence (X-ray or CSF) of congenital infection;
- 59 (7%) were born to women with evidence of treatment failure or reinfection.

Current strategies for syphilis elimination include:

- outside of the South, focus on urban areas; in the South, include urban and rural populations
- develop strong elimination programs in areas considered to be at high risk, even if they now have low rates of disease
- strengthen surveillance, outbreak response, and control measures for areas with persistent and reemerging syphilis
- develop community partnerships to improve access to, and facilitate collaboration with, communities at high risk for infection.

At a meeting in April 2000 on syphilis surveillance, several recommendations concerning surveillance of congenital syphilis emerged. First, CDC should promote and provide training in the standard use of the congenital syphilis case classification algorithm. Health departments should use congenital syphilis case reporting to evaluate missed opportunities for care of pregnant women. Finally, risk indicator information such as drug use and access to care also should be collected.

Potential areas for collaboration between those seeking to prevent congenital syphilis and those seeking to prevent other perinatal infectious diseases include: a) outreach to persons and communities at high risk for HIV and syphilis; b) screening and case-finding for multiple diseases among women at risk; c) case-finding among pregnant women, and d) strengthening coverage and quality of prenatal care.

Group B Streptococcal Prevention Program

Stephanie Schrag, Division of Bacterial and Mycotic Diseases, Centers for Disease Control and Prevention

There has been a 70% decline in early-onset group B streptococcal (GBS) disease from 1989 to1999. One in four women is a carrier for GBS.

The U.S. consensus recommendations (CDC '96, ACOG '96, AAP '97) for GBS advocate either one or the other of these two approaches:

- Screening-based approach: do screening at 35-37 weeks gestation; offer intrapartum antibiotic prophylaxis to women delivering preterm babies and to GBS carriers; or
- Risk-based approach: intrapartum antibiotic prophylaxis to women delivering preterm, to women with duration of membrane rupture 18 hours or longer, or to women with intrapartum fever (temperature of 38 degrees Celsius or above).

An audit of birth records was recently conducted to assess compliance with perinatal infectious disease prevention guidelines (focus on prenatal testing); to re-evaluate perinatal GBS prevention guidelines; and to develop a tool that can aid states or other groups interested in evaluating perinatal disease prevention activities and help them foster an environment for integration of these activities.

A random sample of maternal delivery medical records for 1998 and 1999 births in the Active Bacterial Core Surveillance/Emerging Infections Program Network were reviewed. Besides GBS information, the following is a sample of the information collected:

- HIV: prenatal testing, testing on admission, maternal IV drug use (during current pregnancy or lifetime)
- hepatitis B: prenatal testing, testing on admission, test result, documentation of infant birth dose in maternal chart
- syphilis: prenatal testing, testing on admission, test result, type of test (RPR, VDRL, or FTA).

The study is still ongoing, but we anticipate the following study products:

- recommendations for improved compliance with prevention protocols
- re-evaluation of perinatal group B streptococcal disease prevention guidelines
- improved integration of perinatal prevention programs.

Congenital Rubella Prevention Program

Sue Reef, Epidemiology and Surveillance Division, National Immunization Program, Centers for Disease Control and Prevention

The rubella vaccine was licensed in 1969. Rubella infections are at record low levels with less than 300 cases per year being reported currently. The majority of cases are among foreign-born adults. Outbreaks in 1996 through 1998 were work-associated in more than 50% of the cases; the cases were not usually found among U.S.-born individuals. Since 1993, less than 10 congenital rubella syndrome (CRS) cases per year have been reported. Fifty percent of those were preventable. Since 1997, more than 90% of CRS cases were in infants of foreign-born women.

Prenatal testing and postpartum vaccination have been recommended for more than 2 decades. A recent study by Barth, et al. found that only 21% of hospitals had rubella immunization programs, even though this is the standard of care. Not many states laws mandate prenatal testing for rubella.

Opportunities for screening for multiple diseases:

- during the prenatal period, women should be screened for multiple infectious diseases;
- either during pregnancy or at the time of delivery, the infant can be assessed; and
- for rubella, rubella-susceptible women should be vaccinated prior to leaving the hospital (one dose of vaccine is effective).

States' Experience with Integrating Perinatal Infectious Disease Programs

Richard Holmes, HIV/AIDS Surveillance, Alabama Department of Public Health
Kathryn Arnold, Georgia Division of Public Health

Richard Holmes from Alabama presented information on ways these various programs could be integrated. As an example, he matched the data from HARS with the Artemis database that contains perinatal hepatitis B information. He matched on date of birth and last name. He found 8 women from the Artemis database that were co-infected with HIV. Those 8 women gave birth to 25 children between 1991-1998.

Kathryn Arnold from Georgia presented information on improved collaboration between epidemiology staff and program implementation staff around the perinatal hepatitis B program. To improve prevention of perinatal HBV, an HBV registry was established in 1998. Data from the registry are shared between epidemiology and program staff. For women ages 15-45 with HBV, program staff ask regional health districts for information regarding pregnancy. The goal is to educate women and notify birth hospitals to ensure timely prophylaxis for the infant.

The perinatal HBV prevention program was audited for the year 1999. CDC estimates 300 or more HBV-positive women in Georgia get pregnant each year. In 1999, 102 HBV-positive pregnant women were reported to the program. The audit linked1998/1999 HBV-positive women ages 15-45 in the registry to 1999 mothers in vital records data. There were 182 matches; 39 were in the HBV program.

These data were used to look at the program district by district in the state of Georgia. The numbers matched were compared to the number enrolled in the program. They were able to identify weaknesses in the referral program. Appropriate measures were taken to work with the districts with weaknesses to improve enrollment in the HBV program.